2015 ANNUAL FISHWAYS STATUS REPORT

JOHN DAY DAM

Date: Jan, 2016

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Table of Contents

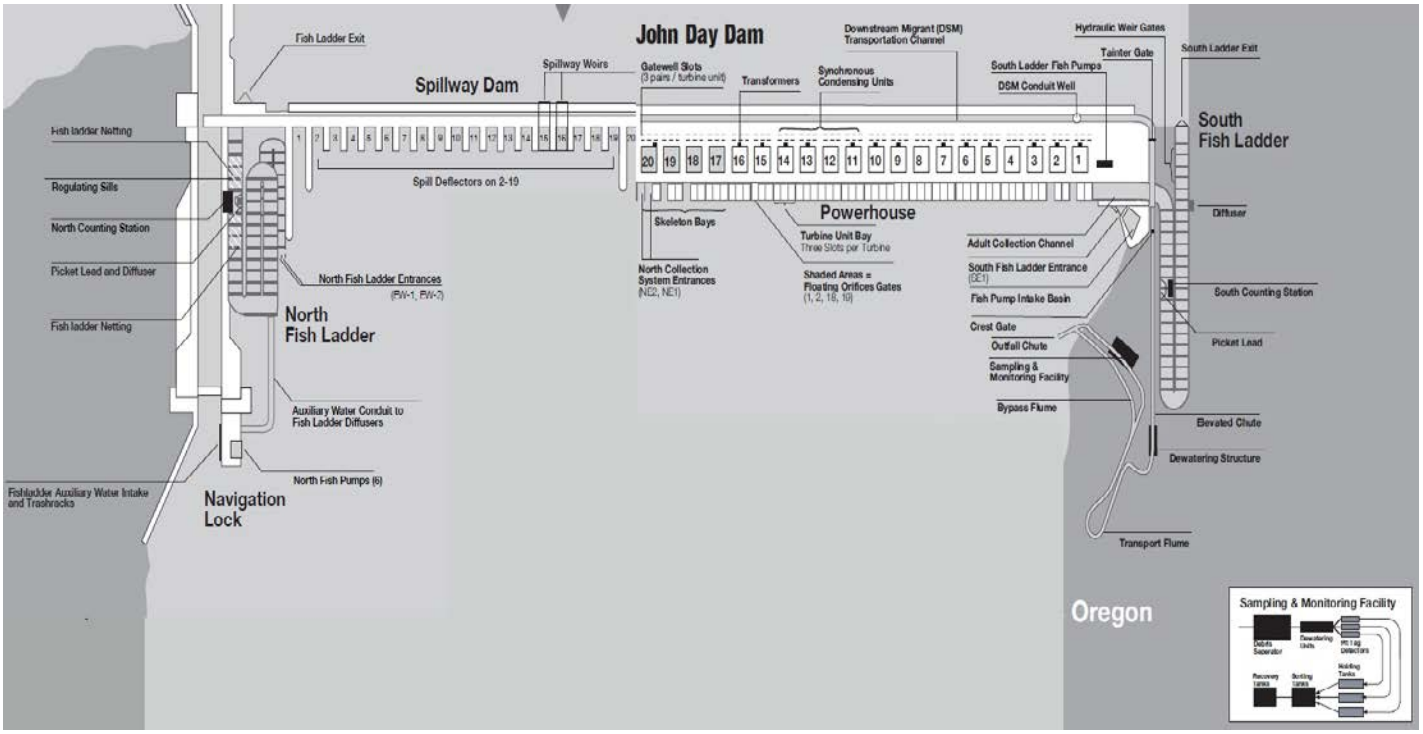

Figure 1: John Day Dam Layout

2015 JOHN DAY FISHWAYS' OPERATING SCHEDULE												
	MONTHS											
PERFORMANCE STATUS	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
	NORTH ADULT FISHWAY											
REGULAR OPERATION W/ AWS	**1/1-11/29**											
AWS OFF HALF DAY FOR ROV INSP.								**8/3**				
DEWATERED FOR MAINTENANCE											**11/29 - 12//23**	
	SOUTH ADULT FISHWAY											
REGULAR OPERATION W/AWS		**2/28-12/31**										
AWS OFF HALF DAY FOR ROV INSP.								**8/3**				
DEWATERED FOR MAINTENANCE	**1/4- 2/26**											
	SMOLT MONITORING FACILITY											
DEWATERED FOR MAINTENANCE	**1/01 - 3/24**											
LIMITED SAMPLING; WATER TEMP > 70F							**6/28- 9/05**					
IN REGULAR SAMPLING MODE				**3/31-6/27**					**9/5-9/15**			
IN BYPASS FOR PIT DETECTIONS										**9/16-11/23**		
DEWATERED FOR MAINTENANCE												**11/24-12/31**
	JUVENILE BYPASS SYSTEM											
1/3 GATEWELL ORIFICES OPEN, ROTATE 2X/WK	**1/1 - 3/24**											
REGULAR OPERATION WITH ALL STSs DEPLOYED				**4/1 - 12/15 for kelts' protection**								
	SPILLWAY WITH 2 TSWs (at bay 18 &19)											
ON SEAL	**1/1 - 4/9**											
OPERATIONS PER FPP SCHEDULE				**4/10 - 8/31**								
1.5 KCFS, BAY 2 ONLY FOR NFL ATTRACTION									**9/1 - 11/30**			
ON SEAL												**12/1-12/31**

Primary Passage **Scheduled Maint.** **Other**

Table 1: Operating Schedule of John Day Fishways in 2015.

Fishway Inspection

Adult fishway inspections were conducted twice daily, during the adult fish passage season (March 1st - November 31st), and once daily during non-passage season. Guidelines were provided by the Corps of Engineers (COE) Fish Passage Plan (FPP), and fishway status reports were completed weekly throughout the year. The John Day Dam (JDA) Smolt Monitoring Facility (SMF) inspections were conducted every two hours, 24 hours per day, throughout the juvenile sampling season (April 1st - Sept 15th). SMF status reports were included in weekly fishway status reports. Any out of criteria (OOC) observations were recorded and monitored (See Table 2).

TOTALS FOR :	2015		2014		2013		2012	
	Total #	% OOC	Total #	% OOC	Total #	% OOC	Total #	% OOC
John Day Dam								
Number of inspections	613		634		634		622	
NORTH FISHWAY								
Exit differential	0	0.00%	0	0.00%	0	0.00%	4	0.60%
Exit regulating weirs position	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Count station differential	0	0.00%	0	0.00%	0	0.00%	2	0.30%
Weir crest depth	0	0.00%	0	0.00%	0	0.00%	2	0.30%
Entrance differential	**1**	**0.16%**	1	0.16%	3	0.50%	26	4.20%
Entrance weir EW1 (now fixed weir)	0	0.00%	N/A	N/A	N/A	N/A	N/A	N/A
SOUTH FISHWAY								
Exit differential	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Exit regulating weirs position	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Count station differential	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Weir crest depth	0	0.00%	0	0.00%	0	0.00%	0	0.00%
South entrance differential	0	0.00%	0	0.00%	2	0.30%	11	1.80%
Entrance weir SE1	0	0.00%	1	0.16%	2	0.30%	10	1.60%
Collection channel velocity	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Bay 1 differential	0	0.00%	0	0.00%	1	0.20%	10	1.60%
N. Entrance PH(Bay 19)differential	0	0.00%	0	0.00%	3	0.50%	10	1.60%
Entrance weir NE1	**5**	**0.82%**	1	0.16%	5	0.80%	14	2.30%
Entrance weir NE2	**5**	**0.82%**	1	0.16%	6	0.90%	13	2.10%
JUVENILE PASSAGE								
Forebay/bypass conduit differential	0	0.00%	0	0.00%	1	0.20%	0	0.00%
Submersible traveling screens	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Turbine trash rack drawdown	0	0.00%	2	0.32%	0	0.00%	0	0.00%
Vertical barrier screen drawdown	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Spill volume	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Spill pattern	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Turbine Unit Priority	0	0.00%	0	0.00%	0	0.00%	23	3.70%
Turbine 1% Efficiency	0	0.00%	0	0.00%	0	0.00%	0	0.00%

Table 2: Out of Criteria Discrepancies

Fish Salvage Procedures

Fishway Dewatering Procedures

During fishway dewaterings, bulkheads were installed and drain valves were opened. After the area was dewatered, fisheries personnel entered the area and salvaged any stranded fish (see table 3). Salvaged fish were transported to either the forebay or tailwater (depending on circumstances such as; fish species, dewatering location, age class, or stress levels). Follow up inspections were performed to account for any overlooked fish. Efforts were made to provide continual water supplies throughout the operation, to minimize fish stress. Minimal fish handling practices were utilized throughout the entire process. Fishway areas not listed were inspected by a Remote Operated Vehicle (ROV).

Turbine Dewatering Procedures

When following operational guidelines, turbine dewatering requires minimal fish handling. If a turbine unit fails, operational guidelines cannot always be followed, which may result in trapped fish. Fish removed from these areas face higher health risks, due to increased handling. Procedures are continually evaluated to determine the best methods to reduce fish stress or mortality. Currently, fish are removed from scroll case and draft tubes by fish bags. Prior to fish salvage transport tanks are prepped for fish transport. If fish volumes are higher than two bags can safely hold, transport tanks are used to remove fish from the draft tube gallery. The transport tanks are then lifted out by crane. Fish caught within the turbines are released in the tailwater with either; a fish bag and rope, or by tank and crane.

Fish Ladder 2015 Dewatering Results

Date	Event	Chinook	Steelhead	Lamprey	Shad	Other	Comments	Morts	Cause
12-Jan	SFL-Upper	-	1A,26J	40A	-	2A-CP	REC	0	N/A
23-Jan	SFL/SE1	-	-	-	1A	1A-CP	REC	0	N/A
29-Jan	SFL-Lower	-	-	3A, 1 JUV	-	1 Juv-CT	REC	0	N/A
17-Feb	SFL-Post weir	-	-	-	-	-	No Fish	0	N/A
18-Feb	SE1 Pool	-	3A	-	-	-	open valve	3	ops too early
1-Dec	NFL-Upper	-	1A,5J	40-A	100A	45-ST, 2CP	ST 3-5'	0	N/A

Smolt Monitoring Facility 2015 Dewatering Results

Date	Event	Chinook	Steelhead	Lamprey	Shad	Other	Comments	Morts	Cause
24-Nov	SMF - PDS	-	153-A	12A	-	12-ST,25-CT	Adults	0	N/A
24-Nov	SMF A-Drain	-	-	23A	-	-	Manually	0	N/A

Juvenile Bypass System 2015 Dewatering Results

Date	Event	Chinook	Steelhead	Lamprey	Shad	Other	Comments	Morts	Cause
20-Jan	CC-annual	-	9A	-	-	-	REC	0	N/A

Turbine 2015 Dewatering Results

Date	Event	Chinook	Steelhead	Lamprey	Shad	Other	Comments	Morts	Cause
6-Feb	MU14-SC	-	-	-	-	1A-CR	REC	0	N/A
10-Feb	MU14-DT	-	-	-	-	-	NO FISH	O	N/A
18-Mar	MU14-SC	-	-	-	-	-	NO FISH	0	N/A
19-Mar	MU9-SC	-	-	-	-	-	NO FISH	0	N/A
23-Mar	MU9-DT	1A	-	-	-	1 Juv-SA	REC	0	N/A
1-Jun	MU13-SC	-	-	-	-	1A-CR	REC	0	N/A
1-Jun	MU13-DT	-	-	-	-	8-ST, 9CT	REC	0	N/A
3-Jun	4C Orifice GW	5J	5J	-	-	-	2-unclip SH	10	Bad Orifice
28-Jul	MU15-GW	-	-	-	-	1A-ST	6' REC	0	N/A
27-Jul	MU12-SC	-	-	-	-	-	NO FISH	0	N/A
29-Jul	MU12-DT	-	-	-	-	6CT, 1 J-ST	REC	0	N/A
6-Aug	MU15-GW	-	-	-	-	1-ST	4' REC	0	N/A
10-Aug	MU15-GW	-	-	-	-	2-ST	2-3' REC	0	N/A
14-Aug	MU15-SC	-	-	-	-	34-ST, 1CT	2-4 Feet	0	N/A
26-Aug	MU3-SC	-	-	-	-	1CT	REC	0	N/A
27-Aug	MU3-DT	-	-	-	-	70-CT,1-ST	REC	0	N/A
16-Sep	MU16-SC	-	-	-	-	50-ST	2-4'	6-ST<1'	Trapped
31-Oct	MU1-SC	1-J	-	-	-	50-ST, 5CT	2-4'	25-ST	Dewater
3-Nov	MU12-SC	-	-	-	-	3-CT	REC	0	0
4-Nov	MU12-DT	-	-	-	-	18CT, 1-ST	-	3-CT old	Unknown

Key

Life stage: adult=A, juvenile=J

Fish: carp=CP, crappie =CR, catfish=CT, lamprey=LR, small mouth bass=SMB, Sturgeon=ST, Unknown Salmonid=SA

Event Location: aux water supply=AWS, collection chamber=CC, diffuser chamber=DC, draft tube=DT, scroll case=SC, south fish ladder=SFL, north fish ladder =NFL, gatewell=GW **Comment:** released in excellent condition=REC

Table 3: John Day Dam's 2015 fish salvage results

Fish Counting

Visual fish counting was conducted April 1st – October 31st during the 2015 adult fish passage season. These counts were conducted through a contract with Normandeau Associates Inc., and all fish count data was sent electronically to an online database. Prior to the 2013 adult fish passage season, the vast majority of fish passage occurred through the South Fishway (> 95 %.) Since completion of the North Fishway Entrance modifications (2010-2012), adult fish passage has become significantly more balanced (nearly 40 % in 2015) (See figure 2).

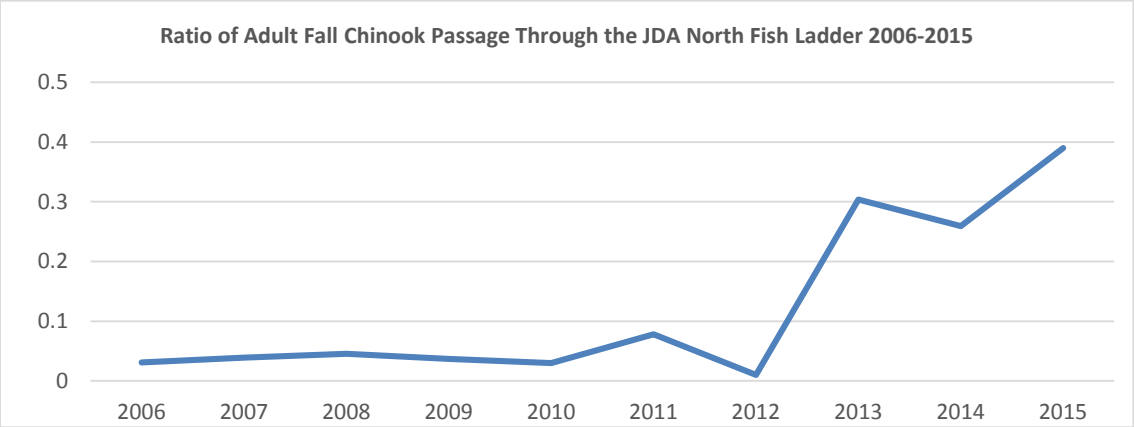

Figure 2: Ratio of adult fall Chinook salmon that migrated through the JDA North Fishway (versus South Fishway) 2006-2015 (September 1st through November 1st).

Pikeminnow Abatement

Northern Pikeminnow (NPM) angling at the John Day powerhouse tailrace was performed by the Washington Department of Fish and Wildlife crew under contract from Pacific States Marine Fisheries Commission between May 1st and October 11th, 2015. The 2015 catch was 3,127 NPM which is lower than the 2014 catch of 4,250, but significantly higher than 2013's 2,370 NPM, 2012's 2,217 NPM, and comparable to 2011's catch of 3,271 NPM. This year angling effort was more concentrated at the Dalles dam due to better angling conditions (catch values do not include total angling effort).

Avian Predator Abatement

Bypassing smolts through spill has become a critical part of JDA fish passage operations (since 2006). As a result, the piscivorous bird predation in the spillway BRZ had increased significantly and become a serious factor in total dam mortality on passing smolts. In response, a comprehensive grid of 125 avian lines was designed and installed at the JDA's tailrace BRZ in 2010 (Figure 3) In addition to avian lines, an intensive, supplemental boat hazing by U.S. Department of Agriculture (USDA-APHIS) has been deployed annually since 2010. Similar to recent years, the USDA hazing crew continued with one 8 hour boat shift, seven days a week, April 15th – July 31st in 2015.

JD BRZ Avian lines, combined with the USDA boat hazing, continued to be an effective tool for deterring gull predation on smolts, in this sensitive area, during the 2015 passage season. The total avian presence/predation at JD Tailrace BRZ was relatively minor in magnitude, and well under control in 2015. It should be emphasized that only gulls are of a serious concern, at JD during the peak smolt passage season, due to their local breeding colonies.

However, the white pelican presence increased from 1,443 in 2014 to 5,050 in 2015 and we are monitoring for any possible breeding colonies near JD. Despite their high numbers, the white pelicans' presence/ feeding peaked primarily after the peak smolt migration in July (see figure 4), and at the downstream edge of SWT3 & PHT3, where it is unlikely to affect smolts to any high degree (they could be consuming other fish species including the smolt predators?)

The grebe numbers at JD forebay also increased significantly and combined with the proliferation of white pelicans at JD tailrace, those two species were, primarily, responsible for the overall increase in total avian predators counted by JD Fisheries in 2015(see figure 5 and table 4); the gulls didn't increase and remained comparable to the low levels from 2013 & 2014.

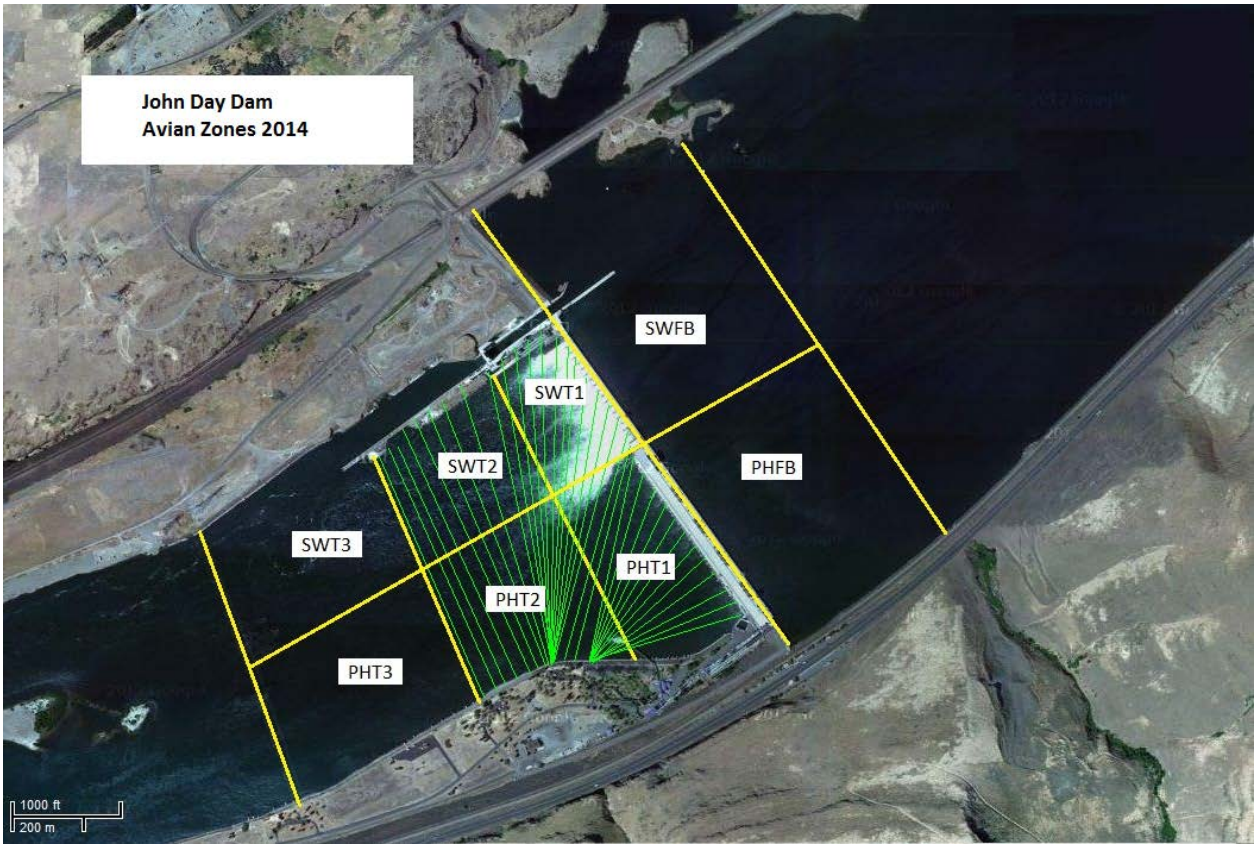

Figure 3: Avian array at JDA Tailrace BRZ installed in 2010 and re-tensioned for 2015 (Powerhouse Forebay-PHFB, Spillway Forebay-SWFB, Powerhouse Tailrace 1-PHT1, Spillway Tailrace 1-3 [SWT1-SWT3], Powerhouse Tailrace 1-3 [PHT1-PHT3]).

Total Piscivorous Bird Observations at John Day Dam (4/1/15 - 9/15/15)

Zone	Gulls				Cormorant				White Pelican				Grebe				Total in Zone
	F(1)	F(2)	NF(1)	NF(2)	F(1)	F(2)	NF(1)	NF(2)	F(1)	F(2)	NF(1)	NF(2)	F(1)	F(2)	NF(1)	NF(2)	
PHFB	43	104	464	420	0	8	20	18	19	4	17	3	897	728	2352	1890	6987
SWFB	41	24	328	394	0	0	3	0	0	0	3	0	5	44	54	52	948
PH1	67	86	17	28	15	8	3	3	166	88	3	4	0	0	0	0	488
PH2	156	175	25	14	2	0	0	0	468	189	27	30	0	0	0	0	1086
PH3	594	607	82	16	0	0	35	3	764	428	123	100	0	0	0	0	2752
SW1	6	5	14	28	11	5	1	2	12	11	0	4	0	0	0	0	99
SW2	55	54	21	61	2	2	7	26	472	231	32	3	0	0	0	0	966
SW3	783	1209	381	356	0	0	75	58	1425	773	246	179	0	0	0	2	5487
Total	1745	2264	1332	1317	30	23	144	110	3326	1724	451	323	902	772	2406	1944	18813

F(1): Foraging during morning survey (with hazing), F(2): Foraging during afternoon survey (no hazing)

NF(1): Non-Foraging during morning survey (with hazing), NF(2): Non-Foraging during afternoon survey (no hazing)

Table 4: Piscivorous predation at JD in 2015.

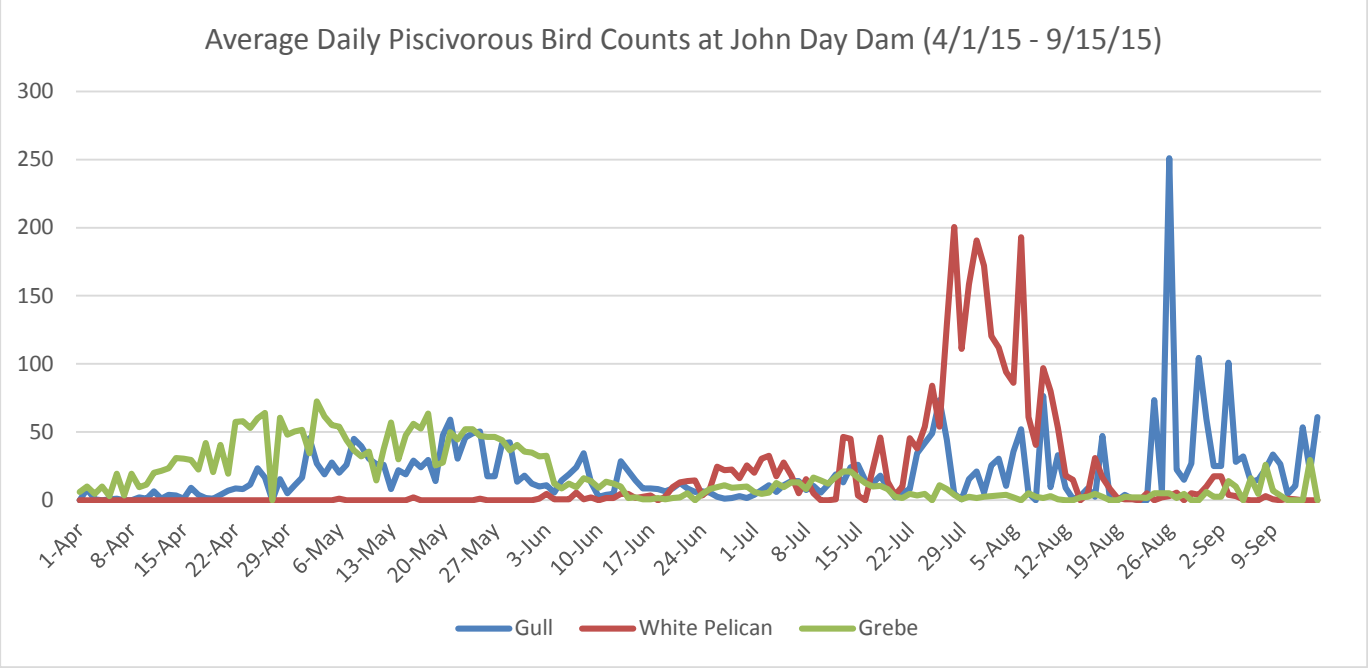

Figure 4: Average Daily Piscivorous Bird Counts at John Day Dam in 2015

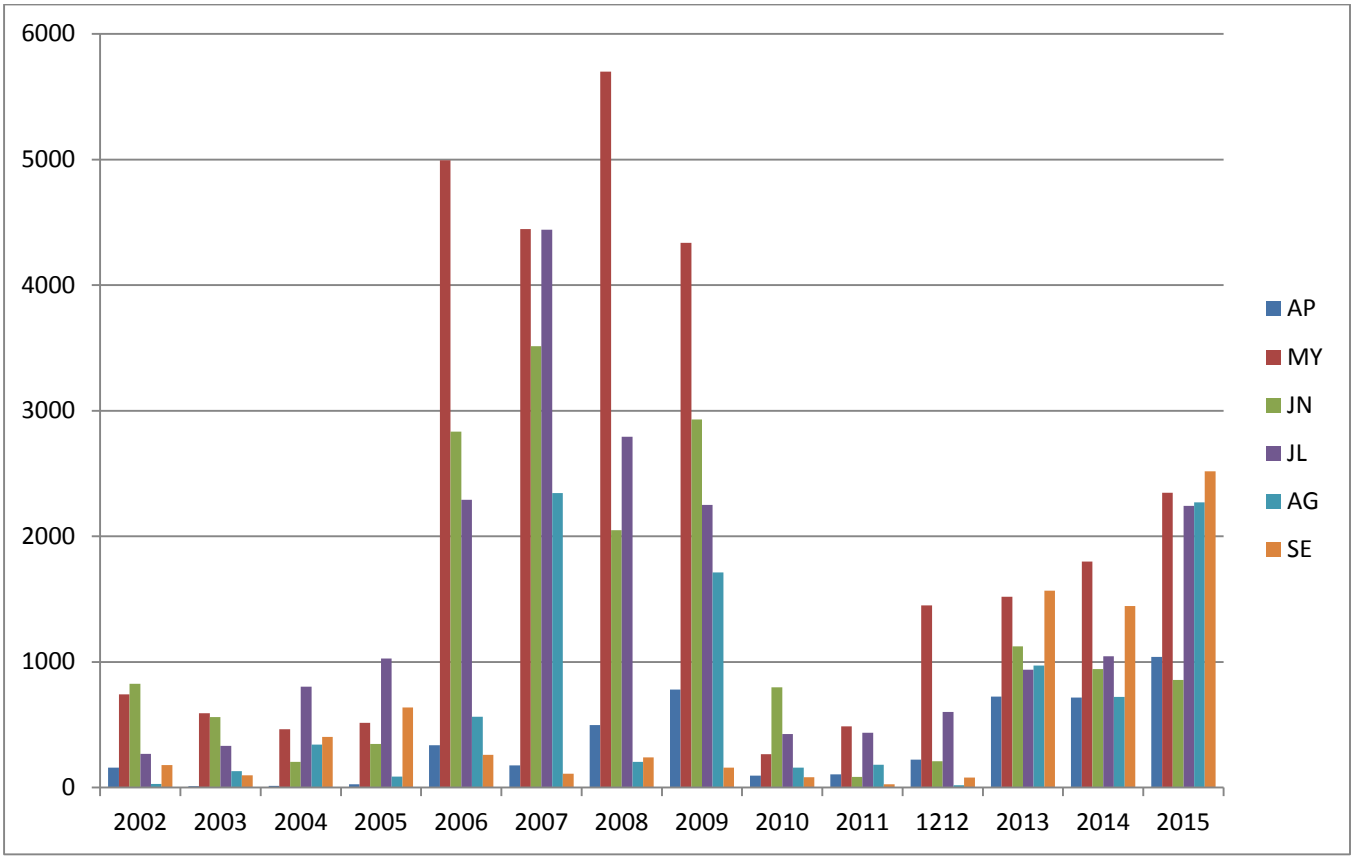

Figure 5: Piscivorous bird foraging observations (2002-2015; April 1st – September 30th) at JDA. AP=April, MY=May, JN=June, JL=July, AG=August, SE=September.

Water Quality

JD daily river temperatures were obtained from the USGS sensor located in the Forebay, at the tip of upstream navigation lock's guide wall. Additionally, the Water Temperatures were collected in both fish ladders at the entrance and exits with HOBO data loggers by JDA Fisheries, 1 April – Nov. 30 (see Figure 6). Water Clarity was read by Secchi disc at the North Fishladder counting station during daily fishway inspections.

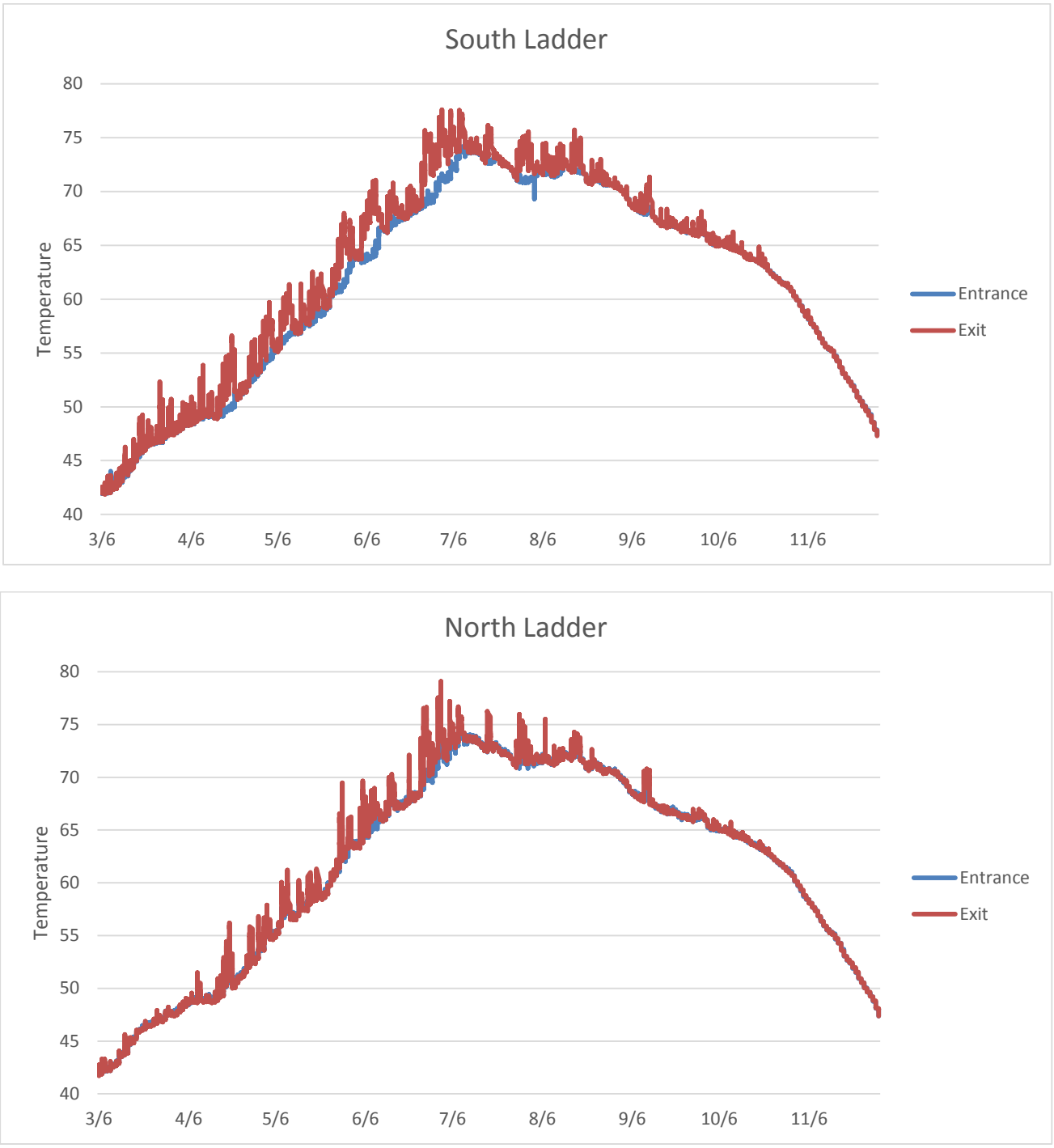

Figure 6: John Day Dam Fishway Water Temperatures 2015

Fishway Velocities – Collection Channel

During the 2015 Adult Fish Passage Season (March 1st- November 1st), the South Fishway, adult collection channel, velocities were estimated on a near weekly basis. Wooden floats were dropped at the head of the collection channel, channel travel times were recorded, and used to calculate velocities. These results were posted in JDA status reports throughout the year. The 2015 JDA South Fishway collection channel velocities were well within the Fish Passage Plan (FPP) criteria of 1.5 to 4.0 f³/s (See Figure 7).

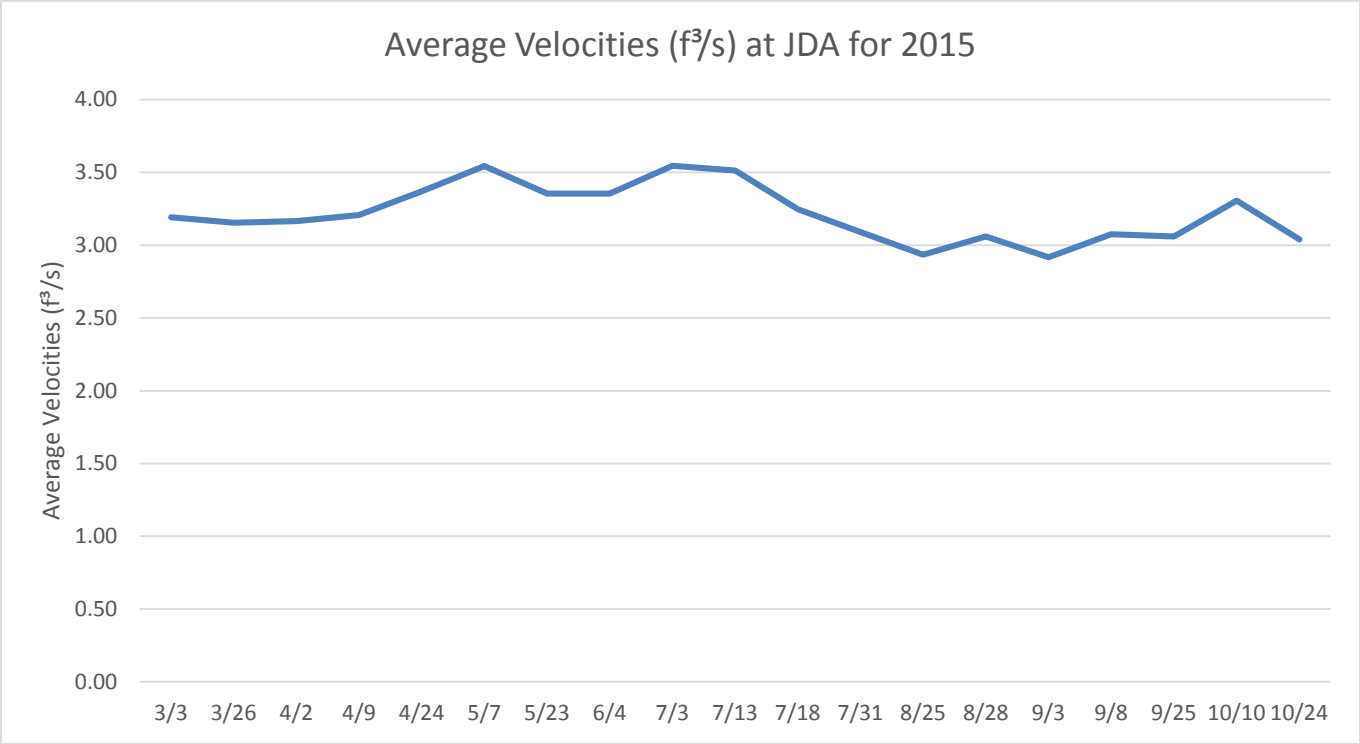

Figure 7: JDA South Fishway collection channel velocities during the 2015 Adult Fish Passage Season (Mar. 1st – Nov. 1st).

Discussion

2015 was a great year for JD as all Fishways performed well and without a major failure. There were only 11 total OOCs (see Table 1), which indicates a near perfect compliance with the FPP requirements. This in turn, demonstrates that all JDA fish passage's control and regulating devices have been properly maintained, operated and monitored. Kudos to all JDA Maintenance, Operations, and Fisheries personnel for their dedication and hard work in improving the fish passage at John Day Dam.

Research

University of Idaho – Maintenance and weekly downloading of half-duplex Lamprey PIT receivers located at the fishways' exits during the 2015 fish passage season.
Also, tagged adult Pacific Lamprey (Steve Lee) trapped in the JD North and South fishways. This was part of a study for the Snake River dams on adult lamprey passage.

Oregon Dept. of Fish and Wildlife – Ongoing BPA funded research associated with the Northern Pikeminnow Management Program. The pikeminnow sampler worked closely with the WDFW/PSMFC northern pikeminnow angling crew that fished the John Day tailrace in order to collect diet sampling and biological data from harvested pikeminnow.

Oregon Department of Fish and Wildlife and Fish Passage Center- Continued to perform the monthly fishway inspections of adult and juvenile fish passage systems.

Washington Department of Fish and Wildlife- Performed dam angling from the PH tailrace deck to remove northern pikeminnow.

Normandeau Environmental Consultants – Continued to perform the annual fish counting at the north and east fishways via count stations.

Fisheries Field Unit – Operated and evaluated the JD North LPS; collected, monitored and released lamprey into forebay.

U.S. Dept. of Agriculture- Performed intensive avian hazing April 16 to July 31 via pyrotechnics from a boat.

Confederate Tribes of the Umatilla Indian Reservation- Captured adult Pacific lamprey as part of the on-going project to restore lamprey to various tributaries. CTUIR cooperated with the Nez Perce, Warm Springs, and Yakama Nation to help their lamprey re-planting programs.

Pacific State Marine Fisheries Commission – Performed daily sampling to obtain the smolt condition, passage index and run timing at JD SMF 1 April through 15 September.
Also, their PIT tags brethren operated and maintained the SMF PIT tag detectors 1 April through 24 November 2015.